

WHAT IS CLAIMED IS:

1. A fireguard circuit for use with a power cable, said power cable connecting a power source with a load, said power cable comprising a power line, a neutral line and a metal sheath which surrounds the power line and the neutral line, said fireguard circuit comprising:

(a) a circuit breaker comprising a first switch located in one of said lines between the power source and the load, said switch having a first position in which the power source in its associated line is connected to the load and a second position in which the power source in its associated line is not connected to the load,

(b) a circuit opening device for setting said switch in either its first position or its second position, said circuit opening device being operable in either a first state or a second state, said circuit opening device setting said switch in its first position when in its first state and said circuit opening device setting said switch in its second position when in its second state,

(c) a first silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR comprising an anode, a cathode and a gate, and

(d) a nuisance tripping resistor connected to said first SCR to reduce the likelihood of nuisance tripping in said first SCR.

2. The fireguard circuit of claim 1 wherein said nuisance tripping resistor includes a pair of terminals, one its terminals being connected to the gate of said first SCR and the other of its terminals being connected to the cathode of said first SCR.

3. The fireguard circuit of claim 1 wherein the power connections for said circuit opening device and said first SCR are derived from said power and neutral lines at the load.

4. The fireguard circuit of claim 1 wherein the power connections for said circuit opening device and said first SCR are derived from said power and neutral lines at the power source.

5. A fireguard circuit for use with a power cable, said power cable connecting a power source with a load, said power cable comprising a power line, a neutral line and a metal sheath which surrounds the power line and the neutral line, said fireguard circuit comprising:

(a) a circuit breaker comprising a first switch located in one of said lines between the power source and the load, said switch having a first position in which the power source in its associated line is connected to the load and a second position in which the power source in its associated line is not connected to the load,

(b) a circuit opening device for setting said switch in either its first position or its second position, said circuit opening device being operable in either a first state or a second state, said circuit opening device setting said switch in its first position when in its first state and said circuit opening device setting said switch in its second position when in its second state,

(c) a first silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR comprising an anode, a cathode and a gate, and

(d) an indicator circuit connected to said power and neutral lines at said load, said

indicator circuit providing an indication as to whether power is being applied to said load.

6. The fireguard circuit of claim 5 wherein said indicator circuit comprises a light emitting diode (LED), a current limiting resistor and a protection diode.

7. The fireguard circuit of claim 6 wherein said LED, said current limiting resistor and said protection diode are connected together in series.

8. The fireguard circuit of claim 6 wherein said LED and said current limiting resistor are connected in series and said LED and said protection diode are connected in parallel.

9. The fireguard circuit of claim 5 further comprising a test circuit connected to said power line to test whether said fireguard circuit is functioning properly.

10. The fireguard circuit of claim 5 wherein the power connections for said circuit opening device and said first SCR are derived from said power and neutral lines at the load.

11. The fireguard circuit of claim 5 wherein the power connections for said circuit opening device and said first SCR are derived from said power and neutral lines at the power source.

12. A fireguard circuit for use with a power cable, said power cable connecting a power source with a load, said power cable comprising a power line, a neutral line and a metal sheath which surrounds the power line and the neutral line, said fireguard circuit comprising:

(a) a circuit breaker comprising a first switch located in one of said lines between the power source and the load, said switch having a first position in which the power source in its associated line is connected to the load and a second position in which the power source in its associated line is not connected to the load,

(b) a circuit opening device for setting said switch in either its first position or its second position, said circuit opening device being operable in either a first state or a second state, said circuit opening device setting said switch in its first position when in its first state and said circuit opening device setting said switch in its second position when in its second state,

(c) a first silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR comprising an anode, a cathode and a gate,

(d) a second silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between the other of said lines and the metal sheath, said second SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between the other of said lines and the metal sheath, said second SCR comprising an anode, a cathode and a gate, and

(e) a zener diode connected to said second SCR to reduce the peak voltage at which the metal sheath biases.

13. The fireguard circuit of claim 12 wherein said zener diode is connected to the gate of said second SCR..

14. The fireguard circuit of claim 12 wherein the power connections for said circuit opening device and said first and second SCRs are derived from said power and neutral lines at the load.

15. The fireguard circuit of claim 12 wherein the power connections for said circuit opening device and said first and second SCRs are derived from said power and neutral lines at the power source.

16. A fireguard circuit for use with a power cable, said power cable connecting a power source with a load, said power cable comprising a power line, a neutral line and a metal sheath which surrounds the power line and the neutral line, said fireguard circuit comprising:

(a) a circuit breaker comprising a first switch located in one of said lines between the power source and the load, said switch having a first position in which the power source in its associated line is connected to the load and a second position in which the power source in its associated line is not connected to the load,

(b) a circuit opening device for setting said switch in either its first position or its second position, said circuit opening device being operable in either a first state or a second state, said circuit opening device setting said switch in its first position when in its first state and said circuit opening device setting said switch in its second position when in its second state,

(c) a first silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR comprising an anode, a cathode and a gate,

(d) a second silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between the other of said lines and the metal sheath, said second SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between the other of said lines and the metal sheath, said second SCR comprising an anode, a cathode and a gate, and

(e) a transistor circuit connected to said second SCR to reduce the peak voltage at which the metal sheath biases.

17. The fireguard circuit of claim 16 wherein said transistor circuit comprises a transistor, first, second and third resistors, a capacitor and a diode.

18. The fireguard circuit of claim 16 wherein said transistor circuit is connected to the gate of said second SCR.

19. The fireguard circuit of claim 16 wherein the power connections for said circuit opening device and said first and second SCRs are derived from said power and neutral lines at the load.

20. The fireguard circuit of claim 16 wherein the power connections for said circuit opening device and said first and second SCRs are derived from said power and neutral lines at the power source.

21. A fireguard circuit for use with a power cable, said power cable connecting a power source with a load, said power cable comprising a power line, a neutral line and a metal sheath which surrounds the power line and the neutral line, said fireguard circuit comprising:

(a) a circuit breaker comprising a first switch located in one of said lines between the power source and the load, said switch having a first position in which the power source in its associated line is connected to the load and a second position in which the power source in its associated line is not connected to the load,

(b) a circuit opening device for setting said switch in either its first position or its second position, said circuit opening device being operable in either a first state or a second state, said circuit opening device setting said switch in its first position when in its first state and said circuit opening device setting said switch in its second position when in its second state,

(c) a first silicon controlled rectifier (SCR) for detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR setting said circuit opening device at its second state upon detecting the presence of an arcing condition between one of said lines and the metal sheath, said first SCR comprising an anode, a cathode and a gate, and

(d) a diode bridge for detecting the presence of an arcing condition between the other of said lines and the metal sheath, said diode bridge setting said circuit opening device at its second state upon detecting the presence of an arcing condition between the other of said lines

and the metal sheath.

22. The fireguard circuit of claim 21 wherein said circuit opening device is connected directly to said first SCR.

23. The fireguard circuit of claim 21 wherein said circuit opening device is connected to said first SCR through said diode bridge.

24. The fireguard circuit of claim 21 wherein the power connections for said circuit opening device, said first SCR and said diode bridge are derived from said power and neutral lines at the load.

25. The fireguard circuit of claim 21 wherein the power connections for said circuit opening device, said first SCR and said diode bridge are derived from said power and neutral lines at the power source.